

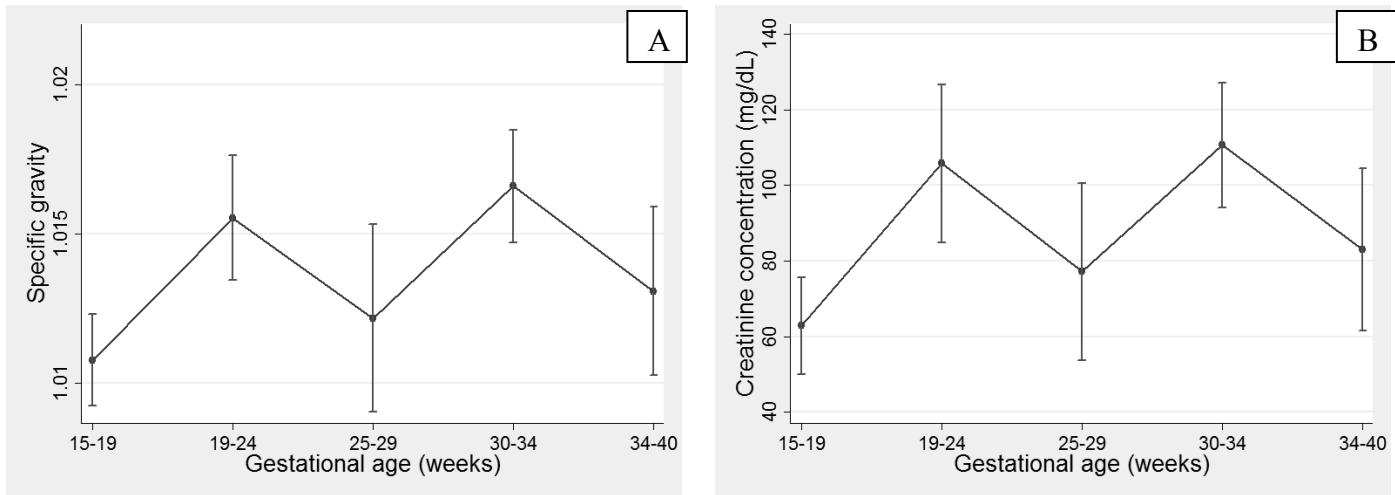
Supplemental Material

Prenatal Exposure to Environmental Phenols: Concentrations in Amniotic Fluid and Variability in Urinary Concentrations during Pregnancy

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Supplemental Material, Figure S1: Mean and 95% confidence intervals for urine specific gravity

(A) and urine creatinine concentration (B) by gestational age, Study of Advanced Reproductive Age and Environmental Health, 2005 to 2008. n = 213 urine samples for specific gravity and 202 for creatinine (creatinine concentrations were missing for 11 of the first spot urine samples).

Supplemental Material, Table S1: Spearman correlation coefficients between pairs of ln-transformed phenol concentrations from the first, second and third samplings (specific gravity corrected, creatinine corrected, and uncorrected for urine dilution), Study of Advanced Reproductive Age and Environmental Health, 2005 to 2008.

| | 2,4-dichlorophenol | | 2,5-dichlorophenol | | Bisphenol A | | Benzophenone-3 | | Triclosan | | Methylparaben | | Ethylparaben | | Propylparaben | | Butylparaben | |
|------------------------------------------------------------------------------|--------------------|-----------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Sampling | 1 st | 2 nd | 1 st | 2 nd | 1 st | 2 nd | 1 st | 2 nd | 1 st | 2 nd | 1 st | 2 nd | 1 st | 2 nd | 1 st | 2 nd | 1 st | 2 nd |
| Specific gravity corrected concentrations (n = 71 women, 213 samples) | | | | | | | | | | | | | | | | | | |
| | 2 nd | 0.70 | | 0.75 | | 0.1 | | 0.77 | | 0.57 | | 0.53 | | 0.51 | | 0.48 | | 0.59 |
| | 3 rd | 0.54 | 0.62 | 0.56 | 0.63 | 0.26 | 0.18 | 0.53 | 0.64 | 0.49 | 0.61 | 0.63 | 0.73 | 0.41 | 0.53 | 0.53 | 0.54 | 0.49 |
| Creatinine corrected concentrations (n = 60 women, 180 samples) ^a | | | | | | | | | | | | | | | | | | |
| | 2 nd | 0.74 | | 0.84 | | 0.15 | | 0.86 | | 0.60 | | 0.55 | | 0.42 | | 0.47 | | 0.61 |
| | 3 rd | 0.41 | 0.56 | 0.58 | 0.63 | 0.39 | 0.07 | 0.65 | 0.70 | 0.57 | 0.57 | 0.64 | 0.68 | 0.40 | 0.44 | 0.57 | 0.55 | 0.61 |
| Crude concentrations (n = 71 women, 213 samples) | | | | | | | | | | | | | | | | | | |
| | 2 nd | 0.59 | | 0.70 | | 0.25 | | 0.68 | | 0.59 | | 0.47 | | 0.48 | | 0.45 | | 0.59 |
| | 3 rd | 0.35 | 0.56 | 0.43 | 0.59 | 0.42 | 0.28 | 0.47 | 0.60 | 0.53 | 0.58 | 0.58 | 0.58 | 0.48 | 0.47 | 0.56 | 0.50 | 0.52 |
| | | | | | | | | | | | | | | | | | | 0.62 |

^aCreatinine concentrations were missing for 11 of the first spot urine samples.

Supplemental Material, Table S2: Spearman correlation coefficients between urine samples collected at specific time intervals using specific gravity corrected, creatinine corrected, and uncorrected phenol concentrations, Study of Advanced Reproductive Age and Environmental Health, 2005 to 2008.

| Analytes | Time interval between samples (weeks) | | | | | | |
|-----------------------------------------------------------|---------------------------------------|--------|---------|----------|----------|----------|-------|
| | <4 | 4 to 6 | 6 to 10 | 10 to 12 | 12 to 14 | 14 to 16 | ≥ 16 |
| Specific gravity corrected concentrations | | | | | | | |
| No of sample pairs | 32 | 32 | 30 | 36 | 24 | 29 | 30 |
| 2,4-dichlorophenol | 0.79 | 0.71 | 0.70 | 0.67 | 0.69 | 0.49 | 0.29 |
| 2,5-dichlorophenol | 0.83 | 0.71 | 0.70 | 0.61 | 0.59 | 0.71 | 0.40 |
| Bisphenol A | 0.29 | -0.10 | 0.34 | 0.25 | 0.43 | 0.38 | -0.32 |
| Benzophenone-3 | 0.80 | 0.74 | 0.59 | 0.7 | 0.75 | 0.58 | 0.29 |
| Triclosan | 0.57 | 0.70 | 0.71 | 0.46 | 0.70 | 0.28 | 0.35 |
| Methyl paraben | 0.59 | 0.56 | 0.61 | 0.58 | 0.70 | 0.61 | 0.63 |
| Ethyl paraben | 0.58 | 0.45 | 0.44 | 0.49 | 0.48 | 0.48 | 0.26 |
| Propyl paraben | 0.51 | 0.43 | 0.64 | 0.37 | 0.38 | 0.62 | 0.56 |
| Butyl paraben | 0.75 | 0.55 | 0.58 | 0.4 | 0.61 | 0.69 | 0.29 |
| Creatinine standardized concentrations^a | | | | | | | |
| No of sample pairs | 28 | 25 | 29 | 29 | 21 | 22 | 26 |
| 2,4-dichlorophenol | 0.88 | 0.65 | 0.63 | 0.69 | 0.41 | 0.41 | 0.22 |
| 2,5-dichlorophenol | 0.77 | 0.89 | 0.71 | 0.66 | 0.44 | 0.81 | 0.38 |
| Bisphenol A | 0.22 | 0.05 | 0.07 | 0.19 | 0.38 | 0.53 | -0.08 |
| Benzophenone-3 | 0.85 | 0.85 | 0.71 | 0.73 | 0.82 | 0.65 | 0.47 |
| Triclosan | 0.64 | 0.68 | 0.54 | 0.48 | 0.74 | 0.56 | 0.49 |
| Methyl paraben | 0.60 | 0.61 | 0.57 | 0.51 | 0.58 | 0.65 | 0.58 |
| Ethyl paraben | 0.48 | 0.46 | 0.40 | 0.30 | 0.27 | 0.58 | 0.42 |
| Propyl paraben | 0.52 | 0.45 | 0.52 | 0.36 | 0.37 | 0.78 | 0.58 |
| Butyl paraben | 0.75 | 0.60 | 0.64 | 0.41 | 0.62 | 0.76 | 0.41 |
| Crude concentrations | | | | | | | |
| No of sample pairs | 32 | 32 | 30 | 36 | 24 | 29 | 30 |
| 2,4-dichlorophenol | 0.67 | 0.75 | 0.40 | 0.58 | 0.43 | 0.29 | 0.16 |
| 2,5-dichlorophenol | 0.84 | 0.64 | 0.52 | 0.57 | 0.49 | 0.40 | 0.32 |
| Bisphenol A | 0.43 | 0.14 | 0.48 | 0.41 | 0.36 | 0.22 | 0.06 |
| Benzophenone-3 | 0.71 | 0.76 | 0.53 | 0.64 | 0.56 | 0.58 | 0.32 |
| Triclosan | 0.67 | 0.67 | 0.51 | 0.51 | 0.69 | 0.31 | 0.49 |
| Methyl paraben | 0.50 | 0.50 | 0.53 | 0.56 | 0.6 | 0.44 | 0.63 |
| Ethyl paraben | 0.46 | 0.54 | 0.41 | 0.44 | 0.57 | 0.51 | 0.35 |
| Propyl paraben | 0.57 | 0.32 | 0.64 | 0.45 | 0.55 | 0.49 | 0.51 |
| Butyl paraben | 0.72 | 0.63 | 0.63 | 0.49 | 0.49 | 0.64 | 0.28 |

^a Creatinine concentrations were missing for 11 of the first spot urine samples.

Supplemental Material, Table S3: Adjusted^a geometric mean (GM) of urinary phenol concentrations according to collection conditions among 213 urine samples from the 71 women of Study of Advanced Reproductive Age and Environmental Health, 2005 to 2008.

| Collection Conditions | n | 2,4-DCP | | 2,5-DCP | | BPA | | BP3 | | TCS | | MP | | EP | | PP | | BP | |
|--------------------------------|-----|---------|----------------|---------|----------------|-----|----------------|------|----------------|------|----------------|------|----------------|-----|----------------|------|----------------|-----|----------------|
| | | GM | p ^b | GM | p ^b | GM | p ^b | GM | p ^b | GM | p ^b | GM | p ^b | GM | p ^b | GM | p ^b | GM | p ^b |
| Gestational age (weeks) | | | 0.39 | | 0.49 | | 0.01 | | 0.49 | | 0.3 | | 0.44 | | 0.87 | | 0.25 | | 0.64 |
| ≤ 18 ^c | 54 | 0.7 | | 12.2 | | 1.0 | | 105 | | 15.8 | | 159 | | 4.1 | | 38.3 | | 1.8 | |
| 18.01 to 22 | 54 | 0.8 | | 11.6 | | 1.4 | | 85.4 | | 17.0 | | 162 | | 4.8 | | 31.1 | | 1.8 | |
| 22.01 to 32 | 58 | 0.9 | | 13.8 | | 1.3 | | 71.5 | | 15.6 | | 123 | | 3.9 | | 22.8 | | 1.4 | |
| > 32 | 47 | 0.9 | | 15.5 | | 1.0 | | 85.3 | | 25.5 | | 143 | | 4.0 | | 31.1 | | 2.1 | |
| Sampling season | | | 0.87 | | 0.33 | | 0.3 | | 0.02 | | 0.98 | | 0.17 | | 0.30 | | 0.1 | | 0.31 |
| Oct-March ^c | 112 | 0.8 | | 12.2 | | 1.1 | | 68.7 | | 17.8 | | 161 | | 4.7 | | 35.6 | | 1.9 | |
| April-Sep | 101 | 0.8 | | 14.2 | | 1.3 | | 110 | | 17.9 | | 130 | | 3.7 | | 25.1 | | 1.5 | |
| Hour of sampling | | | 0.04 | | 0.6 | | 0.12 | | 0.02 | | 0.01 | | 0.17 | | 0.91 | | 0.47 | | 0.01 |
| 8.00 to 11.00 ^c | 67 | 1.0 | | 14.0 | | 1.2 | | 116 | | 20.6 | | 182 | | 4.1 | | 33.4 | | 2.6 | |
| 11.01 to 13.00 | 56 | 0.9 | | 13.2 | | 1.0 | | 56.8 | | 25.0 | | 136 | | 4.7 | | 35.1 | | 1.9 | |
| 13.01 to 15.00 | 56 | 0.8 | | 13.7 | | 1.4 | | 100 | | 16.4 | | 126 | | 3.8 | | 24.6 | | 1.2 | |
| 15.01 to 18.00 | 34 | 0.6 | | 10.5 | | 1.2 | | 71.8 | | 8.8 | | 132 | | 4.2 | | 26.8 | | 1.2 | |
| Day of sampling | | | 0.69 | | 0.45 | | 0.28 | | 0.81 | | 0.95 | | 0.56 | | 0.20 | | 0.75 | | 0.38 |
| Tuesday to Friday ^c | 176 | 0.8 | | 13.5 | | 1.2 | | 86.6 | | 17.9 | | 148 | | 4.4 | | 29.7 | | 1.8 | |
| Monday | 37 | 0.8 | | 11.6 | | 1.0 | | 81.8 | | 17.6 | | 133 | | 3.1 | | 32.2 | | 1.4 | |
| Specific gravity | | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | | 0.11 | | <0.001 | | <0.001 |
| 1.002 to 1.009 ^c | 74 | 0.4 | | 5.4 | | 0.6 | | 54.5 | | 10.1 | | 69.7 | | 3.3 | | 13.5 | | 1.0 | |
| 1.01 to 1.017 | 75 | 1.0 | | 15.3 | | 1.4 | | 86.5 | | 23.1 | | 166 | | 3.8 | | 38.3 | | 1.8 | |
| 1.018 to 1.036 | 64 | 1.8 | | 30.5 | | 2.2 | | 143 | | 25.3 | | 293 | | 6.0 | | 57.8 | | 3.1 | |

^aLinear mixed models were simultaneously adjusted for the collection conditions and also for BMI, maternal age, year of sampling, maternal education and maternal race/ethnicity. ^b p-values of heterogeneity test. ^c Reference category.

Abbreviations: BP: butlyparaben, BPA: bisphenol A, BP3: benzophenone 3, DCP: dichlorophenol, EP: ethylparaben, MP: methylparaben, PP, propylparaben, TCS: triclosan